

Risk Communication

Dr. Robin Koons

Communicating Risk in Critical Situations

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Communicating risk can be both challenging and stressful. It is an art and a science that requires skill and intuition for success. Too often agencies focus on the science and ad-lib the most critical components of risk communication -- the actual message being conveyed. To avoid a disastrous experience, it is essential to have a communication plan in place before you find yourself in a critical situation. As with any strategic planning process, there are basic rules and guidelines you should follow. These rules are general and can be adapted to virtually any situation. The outcome will vary based on the audience receiving the information, the circumstances surrounding the situation (how quickly the communication begins), and the individuals delivering the message.

In developing a framework for successful risk communication, focus on three key areas: (1) your primary goal, (2) internal communication, and (3) external communication:

Establishing Your Goal

The ultimate goal of risk communication is typically stating the health affects to those humans exposed to the agent. The scientific part of the process must come first. Do your homework before conveying your message. A good epidemiologic risk assessment process should take place; the hazard needs to be identified. That is, what is the problem? Is it a chemical or biological agent? How much is present? How widespread is the contaminant? Who/what is the host? What are the environmental conditions that allow for transmission? It is unwise to make assumptions in this critical step. Your sampling techniques need to be well thought out, recorded, and interpreted consistently.

A critical step to the risk assessment process is characterizing the risk. You need to establish the dose-response relationship between the agent and audience perceived at risk. The impact on human health is often based on age, gender, and other important characteristics your epidemiologic assessment has identified (such as vulnerable populations with specific underlying medical conditions, occupations, ethnic background, etc.). Remember, even with all of these factors present, the risk only occurs if the exposure takes place! Make sure this is stated in your message.

Once the scientific data is known, managing the situation follows. Presenting risk assessment data without stating what your agency is doing to manage the situation sets you up for a difficult interaction with the public. This is how hysteria develops, loss of credibility for those agencies in charge, and lack of trust. If your management plan is incomplete -- present what you have. It's okay to let your audience know your agency is working on it and you don't have all the answers yet! Saying something is better than saying nothing at all and being timely is far better than waiting until you have all the answers.

Internal Communication

Risk communication begins in your own office! That first person who answers a question from the public can set the tone for what happens next. Make sure you have a framework in place to communicate internally. Have a template of the memo format for the message you would like your staff to convey -- your goal. Provide your front line people (those taking the incoming calls) with an outline of what should be stated to any caller asking for information related to the situation. Send this statement to agencies and private companies you are working with so

consistency exists for all involved. The goal here is to have everyone conveying the same message. Treat every caller as you would a reporter and train all of your staff on telephone risk communication guidelines.

Interact with outside agencies before you are in a critical situation so you know your contacts and have a procedure in place for the teamwork that must occur when communicating risk. Identify your staff who will be designated to work with the other agencies or private companies involved as part of your contingency plan development.

Use your staff to test your message before communicating to the public. If these professionals and paraprofessionals have concerns or questions after hearing the message, modify the message and test it again. These individuals are not as close to the situation as those conducting the actual investigation and making the management decisions. Thus, they may key in on an important oversight. Risk communication is always a two-way process. Interpret your data but know the limitations of it and be prepared to verbalize those limitations. Expect to make modifications in your message and accept your staff and other agencies/companies as partners in the communication process.

External Communication

Involving the public early has been proven time after time to be critical to the success of communicating risk. Identify groups that represent the community (parent-teacher associations, church leaders, retail associations, etc.) and discuss with them the concerns they are hearing from the community -- don't assume your perception of the fears are the public's actual concerns. People want and expect to be a part of the assessment process and the decision-making when it involves their lives. They are likely to become a more volatile audience if they feel they have no control over the decisions on their lives or dealing with the risks (voluntary versus involuntary decisions, such as helmet laws for motorcycles).

Don't wait until you have all the answers before you communicate anything. Present your message in a timely manner and update them frequently. If you are presenting in a community meeting format and questions are asked that you don't know the answer to ---- say you don't know. It takes a long time to establish credibility and seconds to destroy it! Admitting limitations in your knowledge or the data available is far less damaging than making an erroneous statement. The Internet gives the public a great opportunity to obtain their own answers; don't underestimate the intellect of your audience.

For formal presentations, provide your audience with a written summary. More people are visual learners than auditory and you will have greater success if you allow your audience the opportunity to see your message so they can digest it more quickly and accurately. This will reduce your questions and assist in keeping your presentation on focus. Avoid using technical words and jargon on both the handouts and your screen presentation. For slides, avoid placing words in red. If there are important words or phrases you want your audience to remember, use yellow. The brain retains words highlighted in yellow longer than other colors. Try to hold questions until the end of your presentation -- BUT ---- if the audience is restless and not attentive, stop. You may have missed the boat on the real issues they want answers to so discontinue with your agenda and listen to them. If you have missed what their concerns are, don't even try to finish. Begin writing down what they saying and let your audience know you'll get that information to them. If you have completed your presentation and giving time for questions, tell your audience in advance the time limit they have. This is important to the final success of communicating your message. It also will help control unruly members in the audience and negative behavior that can dilute your message.

Then there is the media. Many dread working with the media for a variety of reasons. But the media can be your greatest mechanism for relaying information to a large audience. As with other agencies you work closely with, establish a rapport with your local paper as part of your

contingency plan. Know where to send a press release and identify your contacts. Give reporters positive feedback on good stories and share with them concerns you had on other articles on an ongoing basis to educate them. If you don't have this opportunity and you get that surprise call, take charge! Too many people behave as a child sitting in the principal's office. They see this authority figure that is intimidating and they feel obliged to answer the questions being asked or respond to attacks. You are not that child and they are not the authority figure! You are not obligated to answer every question or respond to every statement they make. Don't talk fast and don't use technical jargon to just get them off the phone. This is guaranteed to result in a bad story. Speak slowly, concisely, and factually. Follow it up with a written statement to help the reporter succeed in relaying your message. If you don't know the answer to a question, tell them you'll check on it and get back to them. Then, Get Back To Them! They have a deadline and a boss. Respect their deadlines or accept partial responsibility for the product because they will go somewhere else to get their answers.

If you have a camera interview, ask the interviewer what questions they will be asking before going on camera. I never met a reporter who wouldn't share this. But don't ever believe what you say off-camera means it's off the record! Act professional at all times and stay focused on your message. Working with the media is an almost certain entity in situations of risk communication. It is an important part of your contingency plan that is often forgotten. Don't be caught off guard. Keep your internal communication network updated and provide the other agencies and companies involved in the situation with your statement to ensure success.

The final part of the contingency plan for risk communication is the closure. If it is a long and involved situation, this may occur several times as key phases come to an end. Closure requires a debriefing to occur -- with your staff, other agencies or companies involved, and the public. Did you meet your goal? What could have gone more smoothly? What needs to be incorporated into, or removed from, your contingency plan to improve success? Test your options and then implement what works into your revised communication plan. Let the public know there is closure so they aren't left hanging or waiting for more to be done. Don't forget to thank your colleagues, the community representatives, and your counterparts in other agencies. You never know when you'll need them again!

We communicate risk on a daily basis without giving it a second thought. But when the magnitude of the risk or the population at risk increases, our confidence weakens. Risk communication becomes less intimidating and increases in success when you have a plan and you know it works. Improve your agency's response time and communication success by performing tabletop drills. Take articles from newspapers or develop scenarios and talk through what you would do if those situations occurred in your community. Role play by having staff portray those inquisitive or hostile community members that could complicate your plan. The key to risk communication success is being honest, timely, and confident. It is a science that has basic rules to follow to create the desired outcome and it is an art where the variables of the audience and the situation will require some intuition to modify the approach at the right times to insure success. Plan for it and practice it!

Biosecurity Measures When the Military Comes Home

Dr. Hugh Bailey

Biosecurity Measures When the Military Comes Home

CPT Hugh Bailey

ABSTRACT

U.S. Armed forces deploy to a variety of areas worldwide that contain native arthropods, bacteria, and other agents that can be harmful to American agriculture and animals. The importation of these organisms into virgin environments can have a dramatic impact on the economy and the population. This can be seen by current examples in the world today, including the fruit fly problem in California, the importation of non-native poisonous snakes into Guam, and the spread of the Africanized honeybee into the United States. The military, through its public health and entomology professionals, has an aggressive control program to prevent the importation of these agents into the United States. These measures include medical intelligence gathering prior to deployment, epidemiological monitoring of troops while deployed, cleaning and inspecting personnel and equipment prior to redeployment, and monitoring of personnel upon return to the continental United States.

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14. ETM 0043. Inf/Cav Fighting Vehicle, M2/M3 Family. Alabama: USAMC Logistics Support Activity.
15. ETM 0069. Tank, M1, M1A1, M1IP. Alabama: USAMC Logistics Support Activity.
16. ETM 0070. Utility Vehicle, CUCV. Alabama: USAMC Logistics Support Activity.
17. ETM 0110. Excavationg/Construction Equipment. Alabama: USAMC Logistics Support Activity.

PREVENTION OF IMPORTATION OF BIOLOGICS DURING MILITARY RETROGRADE OPERATIONS



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OFFICER

INTRODUCTION

U.S. Armed forces deploy to a variety of areas worldwide that contain native arthropods, bacteria, and other agents that can be harmful to American agriculture and animals. The importation of these organisms into virgin environments can have a dramatic impact on the economy and the population. This can be seen by current examples in the world today, including the fruit fly problem in California, the importation of non-native poisonous snakes into Guam, and the spread of the Africanized honeybee into the United States. The military, through its public health and entomology professionals, has an aggressive control program to prevent the importation of these agents into the United States. These measures include medical intelligence gathering prior to deployment, epidemiological monitoring of troops while deployed, cleaning and inspecting personnel and equipment prior to redeployment, and monitoring of personnel upon return to the continental United States.

PURPOSE

To outline governing policy, procedures, and techniques used by the U.S. Army to prevent the importation of harmful organisms into the Continental United States (CONUS).

OUTLINE

(1 of 2)

- Introduction
- Purpose
- References
- Governing Documents



OUTLINE

(2 of 2)

- Retrograde Operations
- Summary
- Questions
- Conclusion



REFERENCES

(1 of 3)

- Benenson, A.S. 1995. FM 8-33, Control of Communicable Diseases in Man. Washington, D.C.: Department of the Army.
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- AFPMB. Disease Vector Ecology Profiles. Washington D.C.: Defense Pest Management Information Analysis Center. <http://www.afpmb.org/pubs/dveps/dveps.htm>.

PERSONNEL

- Sanitary Engineers/Environmental Science Officers
- Entomologists
- 91S Preventive Medicine Technicians
- Unit Command Surgeon

GOVERNING DOCUMENTS

- Plant Pest Act
- DoD 4500.35
- DoD 5030.49-R
- AR 40-12
- AR 40-5
- CINC/Surgeon Theater Policy

Pre-Deployment

- Medical Intel/Threat Packet Development
 - AFMIC
 - AFPMB Disease Vector Profile
 - NGO Databases
- Preventive Medicine Annex to OpOrder
- Unit Briefing
- Equipment Selection/Packing

Deployment

- Unit Tracking
 - Epidemiology
 - Operations
 - Intratheater Deployment
 - Host Nation Support
- Coordination with Host Nation for Support
- PM Inspections/Recommendations



Retrograde/Redeployment

(1 of 5)

- Coordination w/USDA (60-90 days)
- Coordination w/Host Nation Facilities
- Issue Directives to Redeploying Units
- Site Reconnaissance/Selection
- Conduct of Retrograde Ops
- Command/Control

Coordination w/USDA

(2 of 5)

- 60 - 90 Days out if possible
- Requirements and Special Considerations
- Approving Authority
- Proponent Organization

Coordination w/Host Nation

(3 of 5)

- Layout and Availability of POE
- Resources available
- Special Regulatory considerations
- Threat Level

Directives to Redeploying Units

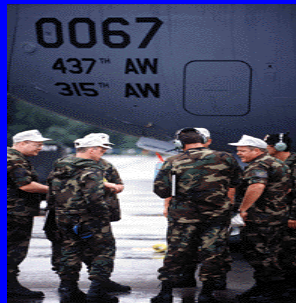
(4 of 5)

- Give commanders a 'heads-up' with time to react to theater requirements
- Normally done 30 days prior to redeployment
- Clarify guidelines and give units a chance to have personnel trained prior to operations

Site Recon and Selection

(5 of 5)

- Should be locked down prior to issuing unit directives
- ESO and inspection team should attend



Site Criteria

(1 of 5)

- Should be sufficient size
- Hardstand if possible, if not, allow for suitable drainage to prevent accumulation of mud and debris
- Designated Inspection, Washing, and Storage Area
- Availability of Fresh Water



Site Criteria

(4 of 5)

- Gray Water Storage/Disposal Capability
- Accessibility/Access Routes
 - To and From Units
 - To and From POE
- Housing Area
- Weather Considerations
- Security



Equipment Requirements

- Raised Wash Area/Inspection Area (Wash Racks are preferred)
- Pressure Washer/Steam Cleaner
- Lights (24 hour operations)
- Power
- Tentage/Warm-Up area





Equipment Requirements

(1 of 2)

- Floodlight set 6
- Cranes as required
- "Y" gates 3
- Fire hose (1 ") 600 feet (2 per wash rack)
- Fire hose (2 ") 200 feet (2 per wash rack)
- Fire nozzles (2 per wash rack)

Equipment Requirements

(2 of 2)

- Pump (55 GPM or greater) 2
- Water truck (5000 gal)
- Steam hose (" l/d, 12 foot lengths) 6
- Steam hose (1 ") 300 feet
- Air compressor 2
- Steam manifold (6 stations)
- Flatbed trucks for movement of supplies as required
- Portable head 2
- Vehicle washracks 4

Recommended Personal Equipment

(1 of 3)

- Cold/Wet weather clothing 40 sets
(assorted sizes)
- Hard hats 40
- Straw brooms 40
- Putty knives 200
- Steel rod (5 feet) 12
- Safety goggles 40
- Rubber gloves 20 pair
(assorted sizes)
- Flashlights (and batteries) 24

Recommended Personal Equipment

(2 of 3)

- Rubber boots 15 pair
- Water tank (3000 gal) 2
- Wire brushes 100
- Rags as required
- Ear plugs 25
- Garden hose/nozzles 75 feet
- Scrub brushes 100
- Vacuum cleaner (wet/dry) min. 6 as required
for aircraft and HUMVEES

Recommended Personal Equipment

(3 of 3)

- RT forklift 4
- Steam Jenny min. 2 as required for aircraft
- Small flat bladed screwdrivers min. 12 for cleaning tracks
- Waterless hand cleaner equivalent of 1 gallon

Site Set-Up/Operation

(1 of 2)

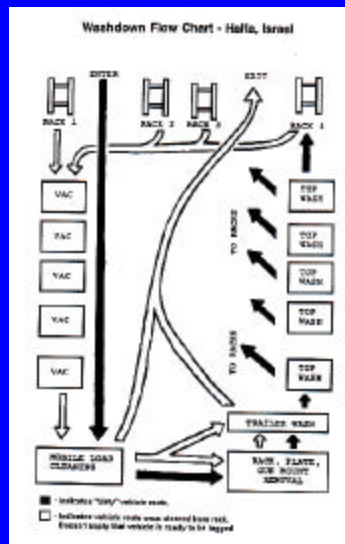
- Reception/Staging Area
 - Conduct Inbrief
 - Conduct Refresher Training as Needed
- Administrative Area
- Pre-Wash/BII Download Area

Site Set-Up/Operation

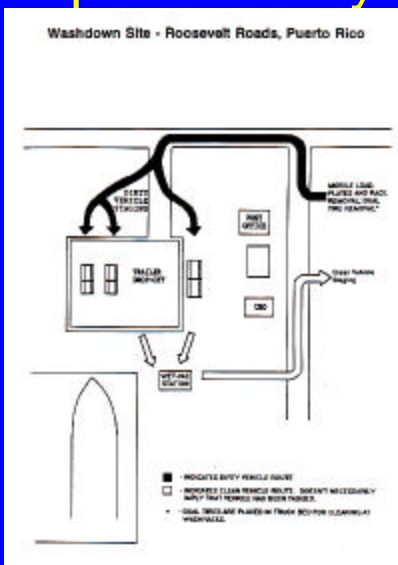
(2 of 2)

- Wash Area/Pre-Inspection
- Inspection Area
- Containment/Shipping Area
- Troop Holding Area

Sample Site Layout



Sample Site Layout





Personnel Requirement

- Site Commander (1)
- Primary Inspectors - 1 per inspection point
- Secondary Inspectors - 1 per washrack
- Admin/Support Personnel as needed

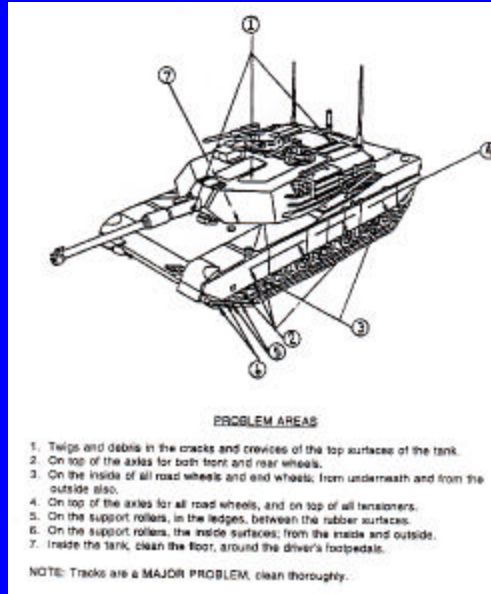
Cleanliness Requirements

- Outlined in TIM 31
 - inspection standards allow only a thin film of road dust on vehicles and equipment at the CONUS final port of entry
- All areas must be cleaned and inspected prior to transportation

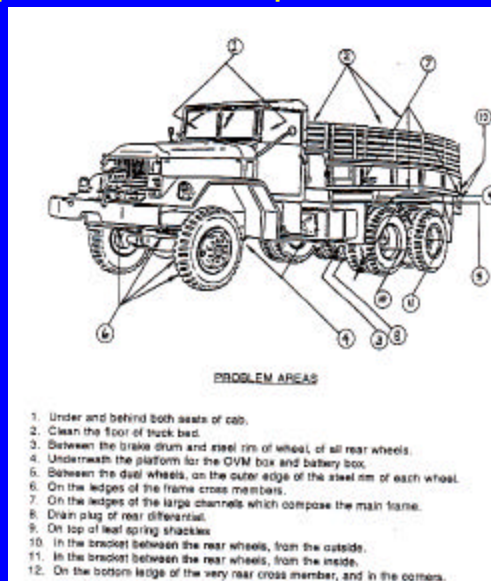
Inspection Procedure

- Outlined in TIM 31 and various Technical Manuals
- Sequence should run top to bottom and not miss any areas
- Once the vehicle is inspected, it is tagged, logged and placed in storage, where it is **not** reused

Sample Vehicle Inspection Guideline



Sample Vehicle Inspection Guideline



Inspection of Personnel

- Check whole baggage for contraband
- Provide personnel with wash facilities and time to clean equipment prior to retrogrades
- Include Team/Unit airloaded equipment

Marking/Log Procedure

- Vehicles marked and logged only if they pass
- Master list along with Memorandum and manifest is sent with convoy commander to POE inspector
- Copy is maintained at inspecting unit

Vehicle Tag

WASHDOWN CLEARANCE

○ VEHICLE #: X215792 TYPE: M998

DATE: 8 DEC 93 INITIALS: SG

Log/Manifest

#	Vehicle Type	Serial #	Date Inspected	Initials
105	HUMVEE	550370	20 Oct	DL
106	5-Ton	571269	20 Oct	DL
107	Jeep	632848	20 Oct	DL
108	Jeep	620868	20 Oct	DL
109	Jeep	604321	21 Oct	DL
110	P/U Truck	591681	21 Oct	DL
111	5-Ton	563002	21 Oct	DL
112	Jeep - NOT PASSED	551360	Remained on ship	Inspect at Evans
113	LAST ENTRY			
114				
115				

TTPs

- Experience inspectors are essential to success of the operation
- The inspecting unit must have the support of the command
- More time placed into planning = less time needed to conduct the operation

Summary

- Governing Regulations
- Predeployment and Deployment Controls
- Retrograde Operations

????QUESTIONS????

Conclusion

- Military preventive medicine does not end when the mission is completed, it encompasses the entire aspect of operations, to include the prevention of importation of destructive agents into the United States.

Panama Canal Shutdown or Screwworms Dujor

Dr. Todd Thomas

SCREWWORM CONTAINMENT IN PANAMA DURING FINAL MILITARY WITHDRAWAL

**CPT TODD M. THOMAS
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INTRODUCTION

Screwworm is a devastating parasitic disease that has long been a leading cause of livestock losses in temperate areas of the Western Hemisphere. The larvae of the Screwworm fly, *Cochliomyia hominivorax*, feed on open wounds of warm-blooded animals, including man. Unlike ordinary maggots that subsist on debris and dead tissue, the Screwworm larvae attack living flesh, causing debilitation and sometimes-even death. A unique biological control program was used to eradicate Screwworm from the United States and neighboring countries. Since 1966 the US Department of Agriculture (USDA) has managed Screwworm as a Foreign Animal Disease (FAD) with a surveillance program to prevent its re-establishment in the US. After more than 30 years of cooperative effort between the USDA and individual Central American countries, the eradication program proceeded as far south as Panama. Despite this success, Screwworm still periodically re-enters the United States with animals arriving from endemic countries to the south. The latest incident involving military members occurred in November 1997 when a pet harboring the parasite came to the US from Panama with a returning service member. Fortunately, early recognition of the problem prevented a serious outbreak and saved the considerable expenses of a quarantine and the renewal of the eradication efforts in the US. In the spring and summer of 1999, the Department of Defense (DoD) began final withdrawal of its personnel from Panama in compliance with the 1977 Carter-Torrijos Panama Canal Treaty. It was estimated that this exodus of nearly 5,000 DoD personnel would include more than 2,500 family pets. US Army Veterinary Corps Officers assigned to the Panama District Veterinary Command (PDVC) worked in close cooperation with the USDA and the Panamanian Ministry of Agriculture to mount an intensive effort to contain endemic Screwworm to Panama and to minimize the threat of Screwworm re-introduction to the U.S. during this large influx of returning pets.

SCREWWORM - BIOLOGY AND ERADICATION PROGRAM

The Screwworm is a larval maggot, the developmental stage of a fly that hatches from eggs laid near a wound. Larvae must feed on live tissue in order to develop further and complete the parasitic life cycle. Debilitation and death ensues when successive Screwworm hatches release thousands of larvae that excavate and greatly enlarge a wound. Surprisingly, the larval feeding does not seem to be painful to the host and even the accompanying tissue inflammation is minimal.

Larvae feed in a wound for five to seven days before maturing to pupae. Screwworm pupae fall to the ground and burrow into the soil where development to adulthood takes another eight days. Within two days of emergence from the soil the adult fly reaches sexual maturity. Thus, an entire life cycle from egg to adult can occur in less than three weeks. Livestock and wildlife are most frequently affected, but Screwworm infestation of pet animals also regularly occurs. Pets that are kept outdoors understandably have a greater risk of exposure to Screwworm than house-pets. Screwworm eggs hatch quickly, usually within 12 hours, so fresh wounds must be rapidly detected and immediately treated with organophosphate insecticides to kill Screwworm larvae.

A highly successful eradication program has effectively eliminated the parasite from most of North America. The eradication program takes advantage of a unique feature of the mating routine of the female Screwworm fly: she mates only once during her entire lifetime, while males mate as many as 10 times. Researchers knew that if enough wild females mated with sterilized males, the Screwworm population could be rapidly eliminated. During a test release, irradiated sterile flies successfully eradicated Screwworm from Curacao, a small island in the Dutch Indies near Venezuela. Building on this success, the USDA developed fly rearing techniques and began large-scale production and dispersion of sterile flies from airplanes. These efforts led to the eradication of Screwworm from the United States.

Despite eradication of Screwworm in the US, the frequent re-introduction of the fly from the Mexican side of the 2000-mile long international border prevented the permanent exclusion of the pest from US soil. It soon became obvious that it would be necessary for the USDA to work cooperatively with Mexico and her southern neighbors to help them in eliminating the fly in order to keep the US

Screwworm-free. The USDA's Animal and Plant Health Inspection Service initiated and continues to sustain a series of cooperative eradication programs that have systematically eliminated Screwworm from most of Central America over the last three decades. In late 1998 the USDA and Panama began the final phase of the Screwworm eradication program in that southern-most Central American country. Because there is no Screwworm control plan for South America, sterile fly release across eastern Panama will continue to be necessary even after Panama becomes Screwworm-free. The sterile flies will create and maintain a biological barrier in Panama's Darien Gap, halting the pest's northward migration at the Panama-Columbia border. In addition to South America, Screwworm also remains endemic on a few islands in the Caribbean (principally Hispanola, and Cuba).

SCREWORM THREAT REDUCTION IN PANAMA – SPRING & SUMMER 1999

Even though the USDA's Screwworm eradication program had reached Panama by late 1998, complete eradication would take at least two more years – too late to eliminate the possibility of Screwworm in pets departing with DoD personnel in the spring and summer of 1999. Keeping Screwworm out of the US hinged upon detecting and eliminating the parasite in pets in Panama prior to their departure for the US. In recent years the Army Veterinary Treatment Facility (VTF) located on the Pacific side of the Isthmus of Panama at Ft. Clayton had routinely treated as many as 20 pets per month for Screwworm during Panama's wet season, May through December. With the upcoming mass exodus of people and pets out of Panama it seemed likely that extraordinary precautions would be necessary to keep Screwworm from again reentering the US.

A plan was developed to intensify Screwworm surveillance of departing pets in Panama. Panamanian and U.S. law requires that animals undergo an examination for issuance of a Health Certificate prior to travel. Additionally, a Panamanian export certificate is also required for customs clearance. Because Health Certificates are valid for up to 10 days after the date of issue, there is ample time for a pet cleared to leave Panama to become infested with Screwworm between its examination and departure dates. In fact, the short 12-hour period from egg laying to larval hatch means that a pet with an open wound could become infested with Screwworm right up to the time of departure from Panama. It would be necessary to close the 10-day gap between the Health Certificate examination and departure to improve Screwworm surveillance during DoD's withdrawal. Because final examination of pets on the day of departure at the air terminal proved impractical, a compromise plan provided for a second Screwworm check of pets at the owner's home or hotel room within 48 hours of their departure. At this second exam, owners would be given their departure documents and receive information on the signs and symptoms of Screwworm. They would also learn how to contact military and federal authorities for help should they suspect Screwworm in their pets following the final exam. During the health certificate examination, departing pets also received a subcutaneous injection of Ivermectin at a rate of 300 ug/kg of body weight as a larvicide. Collie type dogs were exempt from this requirement because of their hypersensitivity to Ivermectin.

The next step in the overall prevention plan required the informed participation of veterinary and agricultural regulatory officials from both the US and Panama. At the March 1999 US Army Veterinary Command (VETCOM) Military Veterinary Symposium, a portion of the poster session and a lecture/discussion segment was devoted to informing all Veterinary Corps Officers (VCOs) of the plan to minimize the impending Screwworm threat from Panama. Private veterinary practitioners in the US were also alerted to the Screwworm threat by an article in the March 1st issue of the Journal of the American Veterinary Medical Association. Finally in April, a specially produced Army Training video was distributed to state and federal regulatory veterinarians informing them of the plan for Screwworm prevention in pets leaving Panama during the summer of 1999.

Additionally, an agreement was completed between VETCOM (representing DoD) and the USDA establishing procedures that would permit the transport of recently infested pets to the US after they had been cleared of Screwworm in Panama. Previously, Screwworm infested pets were denied exit from Panama and were held in quarantine until their wounds healed. The new procedure permitted travel after anti-larval treatment was completed in Panama. Complete healing of the wound was not required for transport. Instead the plan mandated a confirmatory follow-up examination of the pet within five days of arrival in the US to verify the pet's Screwworm-free status.

In order to handle the increased workload that the plan placed on the PDVC in Panama, a request was approved for additional veterinary resources from US Army Forces Command (FORSCOM). The 94th Medical Detachment (Veterinary Medicine), a veterinary field unit was tasked to deploy in May 99 to set up a satellite VTF on the west bank of the Panama Canal to provide an additional pet examination and outprocessing center during peak months of the withdrawal. The unit provided the added capacity that made it possible to thoroughly and rapidly process outgoing pets.

RESULTS

PDVC personnel began heightened surveillance in January 1999 and the requests for health certificates rose sharply starting in March—slightly earlier than predicted. Between January and July 1999, 1363 health certificates were issued (195 per month average), as compared to 563 (80 per month average) during the same time period in 1998. With a 243 per cent increase, the chances of seeing screwworm cases was no doubt higher as well. However, veterinary personnel were beginning to see improvement in the local fly population as the release program moved into the canal area. During the same time period in 1999, there were 23 screwworm cases confirmed by veterinary personnel compared to 35 cases in 1998. However, as projected by DoD personnel, ten of those 23 cases in 1999 occurred in June as rainy season began and the withdrawal was in full gear.

Fortunately for veterinary personnel in Panama and the U.S., only one dog was identified that was infested at the time a health certificate was needed. The animal was immediately hospitalized and treatment begun. Simultaneously, DoD and USDA authorities in the U.S. were notified and tentative travel plans were made. Once the infestation was cleared in Panama, the animal was granted conditional entry into the U.S., pending examination of the remaining wound upon arrival. The wound was examined by AVIC personnel in Atlanta and released to the owner. No further follow-up was deemed necessary.

DISCUSSION

In endemic areas Screwworm infestation is usually a straightforward diagnosis made by simple observation of the maturing larvae (from 1-2 mm to 15 mm in length) in a wound. But when larvae are barely visible shortly after hatching, even experienced personnel can easily overlook them. In addition to such obscure presentations, other systemic difficulties in the Screwworm surveillance program were uncovered when a case of Screwworm was reported from Texas in late November 1997. In that case, Screwworm was discovered in a dog in San Antonio three days after its arrival with a military service member from Panama. The pet had undergone a routine health certificate exam in Panama only three days before its departure. Once in Texas, the dog's owner consulted a private veterinary practitioner when the dog showed signs of lameness (now six days since its Health Certificate examination in Panama). Screwworm was found in a small wound of the paw. In this case, Screwworm was probably present, albeit in a very early stage of development, and was inadvertently overlooked when the dog was examined in Panama. Even so, at the second line of defense, USDA inspectors also had the chance to detect Screwworm when this dog entered the US port of entry in Miami. Unfortunately, the dog was not even examined in Miami because budget restrictions and other mission priorities do not allow for enough veterinary inspectors to check each and every pet animal upon arrival in the US. In this case only the concern of the owner and a thorough examination led to a diagnosis. This case history highlights the all-important role that private veterinary practitioners have in the diagnosis of Screwworm and other foreign animal diseases when routine surveillance procedures fail. The focus on Screwworm biology and identification in veterinary parasitology courses in the US Veterinary Colleges has no doubt lessened over the three decades since eradication. Thus, the recognition of Screwworm by younger veterinarians as occurred in this case becomes less likely as our more experienced practitioners retire.

Preventive treatment of animals prior to transport was pursued as a way to provide protection against the parasite in occult infestations or when wounds occur after the final exam. Drugs are available that promise to prevent survival and maturation of invading Screwworm larvae for up to 14 days. Recent research done in cattle and sheep had shown that Doramectin, a member of the avermectins, (a group of broad spectrum anti-parasitic drugs) shows efficacy in killing early stage Screwworm larvae. No efficacy or safety tests have been done for Doramectin as a Screwworm preventative in dogs or cats. However, an oral formulation of a related drug, Ivermectin, is licensed and widely used in pet animals to prevent Heartworm disease (at a dose of 6 ug/kg). Additionally, although the injectible formulation of Ivermectin is not labeled for use in pets, there is widespread literature documenting its safe extra-label use at much

higher doses than the oral product for control of parasites in dogs and cats. Based on the available safety evidence and Ivermectin's potential efficacy against Screwworm larvae, a decision was made to give pets leaving Panama an injection of Ivermectin at 300 micrograms/kilogram of body weight at the time of Health Certificate exam. Only those animals with a hypersensitivity to Ivermectin (principally Collie-breed dogs) were exempted from this requirement. Although there is no way of assessing the efficacy of this preventive strategy, no untoward drug reactions were noted in any of the pets receiving Ivermectin.

Overall, the Screwworm containment effort was effective in preventing re-entry of the parasite to the US. The deployment to Panama of FORSCOM veterinary personnel specifically devoted to Screwworm containment allowed the intensification of Screwworm surveillance of departing animals. These resources on the ground in Panama insured that every pet was thoroughly checked and then rechecked for Screwworm during the peak of the large influx of pets returning to the US. No doubt the coincidental diminution of the Screwworm flies by the rapid progress of the ongoing USDA-Panama Screwworm Eradication program also contributed substantially to the success of the containment effort.

Additionally, an unrelated circumstance prompted the early return of many pets to CONUS and significantly reduced the number of pets departing during the peak months of the withdrawal. Because of previous problems and liability concerns, it has become common for air carriers to deny transport of pets during the hottest summer months when temperatures regularly exceed 85°F. Many owners elected to ship their pets out of Panama early in the spring to avoid summer travel restrictions imposed by some air carriers.

Historically, the employment of military veterinary assets has provided necessary manpower to assist the USDA in FAD emergencies. Control of Screwworm in animals at the point of origin in Panama rather than at the point of entry in the US appeared to be the most cost-effective prevention option available. Employment of this strategy allowed the USDA to maintain its selective screening of imported animals at all US ports of entry rather than assigning additional resources to specific ports to cover the intermittent arrival of pets from Panama. The timely application of adequate resources in Panama from May through August 1999 in a coordinated proactive plan also saved the cost of controlling a Screwworm outbreak in the US. Expected costs for eliminating an outbreak include those related to the investigation and quarantine of suspect cases and the subsequent costs of eradication (sterile fly release flights). Estimates quickly exceed a million dollars for eradication of even a very small focus.

Cooperation between US Army Veterinarians and the USDA is in concert with national disaster planning related to FADs. The timely deployment of the 94th Medical Detachment (Veterinary Medicine) to Panama for Screwworm containment further strengthened the relationship between the military and the USDA. Veterinary TO&E units such as the 94th Med Det train specifically to execute these types of missions. A growing number of VCOs have also received specialized training in FAD recognition at the FAD Diagnosticians course held at the USDA's biological containment facilities at Plum Island New York.

CONCLUSION

A coordinated cooperative effort among multiple agencies from both the US and Panama, averted a potentially disastrous Screwworm outbreak in the US associated with the DoD withdrawal from Panama during the summer of 1999. This successful operation emphasizes the added value of timely planning, increased awareness and close coordination between US Army Veterinarians and the USDA in protecting the US against future FAD outbreaks.